# 2009

# Annual Report

**The North Carolina**
**State Water Infrastructure Commission**

**To**

**The Governor**
**And Members of the North Carolina General Assembly**

**December 7, 2009**

The State Water Infrastructure Commission was created by act of the North Carolina General Assembly in 2005. The purpose of the Commission is to identify the State's water infrastructure needs, develop a plan to meet those needs, and monitor implementation of the plan. The Commission is comprised of 13 members representing State agencies and non-profits, organizations representing North Carolina local governments and members of the water infrastructure and water resources professions.

**Report Author**: Jean Crews-Klein, Staff to Commission

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## *Background on the State Water Infrastructure Commission*

The State Water Infrastructure Commission (SWIC) was created through passage of House Bill 1095 during the 2005 Session of the North Carolina General Assembly. Passage of this bill was led by The Honorable John Kerr of the NC Senate and The Honorable Pryor Gibson of the NC House of Representatives and supported widely by members of the General Assembly. The bill is codified as Session Law 2005-454, "An Act to Establish Uniform Criteria for Drinking Water, Wastewater and Stormwater Loans and Grants, to Clarify and Revise the Procedures that Apply to These Loans and Grants to Reflect the Exhaustion of the 1998 Clean Water Bond Proceeds, and to Provide for Greater Coordination Among Agencies that Make Loans and Grants for Water Projects by Establishing the Water Infrastructure Commission."

The drive for creating the SWIC was to have available a forum where members could engage in proactive policy discussions relating to infrastructure. Of significance to the creators of SWIC were: 1) to make certain that the State's policies governing infrastructure financing were refined and updated to better align with current trends, and 2) to define the role of the State in providing financial resources and supporting best management practices for needed infrastructure investments.

The creation of the Commission and the modifications to the State's existing water and wastewater finance law were the product of a collaborative effort between major State funders of infrastructure including the Department of Environment and Natural Resources, the Clean Water Management Trust Fund and the Rural Economic Development Center. Together, these three entities have served as the administering agents of State funds and through this continue to make important water, wastewater and storm water investments that have protected public health and the environment and created opportunities for economic growth and development.

Appointments were completed in May 2006 and the Commission held its first meeting that month. A list of the current members of the Board of Directors and the assigned duties of the Commission follow below.

## *Members of the State Water Infrastructure Commission:*

## *2008 – 2010*

### *Standing Members*

Bill Holman, Chairman, Appointee of Senate President Pro Tempore

Robin Smith, NC Department of Environment and Natural Resources

James Hardin, NC Department of Commerce

Billy Ray Hall, President, NC Rural Economic Development Center

Ellis Hankins, Executive Director, NC League of Municipalities

Vance Holloman, Deputy State Treasurer, Office of State Treasurer

David Thompson, Executive Director, NC Association of County Commissioners

Richard Rogers, Executive Director, Clean Water Management Trust Fund

### *Appointed Members*

Dr. Downey Brill, Professor, NC State University (Chancellor's Appointee)

Steve Cavanaugh, P.E., Cavanaugh Associates (American Council of Engineering Companies Appointee)

Harold Herring, Executive Director, Neuse Regional Water and Sewer Authority (Appointee of the Governor)

The Honorable Bill Owens, NC House of Representatives (Appointee of Speaker of the House)

Richard Whisnant, Associate Professor, UNC School of Government (Appointee of Water Resources Research Institute)

## *Duties of the State Water Infrastructure Commission:*

The purpose of the SWIC, as established by the North Carolina Legislature, is to identify the State's water infrastructure needs, develop a plan to meet those needs, and monitor implementation of the plan. The original, specific duties assigned are shown below:

1. **To assess and make recommendations on the role of the State in the development and funding of wastewater, drinking water, and storm water infrastructure in the State.**

2. **To analyze the adequacy of projected funding to meet projected needs over the next five years.**

3. **To propose State priorities for funding.**

4. **To make recommendations on ways to maximize the use of current funding resources, whether federal, State, or local, and to ensure that funds are used in a coordinated manner.**

5. **To review the application of management practices in wastewater, drinking water, and stormwater utilities and determine the best practices.**

6. **To assess the role of public-private partnerships in the future provision of utility service.**

7. **To assess the application of the river basin approach to utility planning and management.**

8. **To assess the need for a "troubled system" protocol.**

## *Duties Included in the 2008 "Drought Bill"*

In a subsequent Legislative Session, the SWIC has been assigned additional duties. Specifically, in the 2008 Session, the SWIC was tasked with developing guidelines for local water systems to follow to set rates at a level to sustain the operation of the system and guidelines for developing water conservation rates. This was included as part of the "Drought Bill", Session Law 2008-143, Section 17. In accordance with the law, an interim report was delivered in January 2009. Recommendations on the water rates to sustain the system are included in this Report beginning on page 9. Commission work on the water conservation rates is ongoing.

**Session Law 2008-143, Section 17:**

> **The State Water Infrastructure Commission, in consultation with the Department of Environment and Natural Resources, the School of Government at the University of North Carolina at Chapel Hill, the North Carolina Utilities Commission, the Public Staff of the North Carolina Utilities Commission, and the Local Government Commission, shall develop guidelines for water rate structures that are adequate to pay the cost of maintaining, repairing, and operating the system, including payment of principal and interest on indebtedness incurred for maintenance or improvement of the water system. The guidelines shall also consider the effect of water rates on water conservation and recommend rate structures that support water conservation. Copies of the guidelines shall be made available to the Department of Environment and Natural Resources, the North Carolina Utilities Commission, and to all local government water systems and large community water systems, as defined in G.S. 143-350. The Commission shall report to the Environmental Review Commission on its progress in developing the guidelines no later than January 1, 2009.**

## *SWIC Meetings Fiscal Year 2008-2009*

The SWIC provides a monthly, public forum for local governments, state agencies, water professionals, water utilities, funders, and the public to share information, debate ideas, and develop recommendations to the Governor and General Assembly. The SWIC began meeting in Fiscal Year 2006. While required only to meet quarterly, SWIC members voted early on to meet monthly in order to address the numerous issues before the State related to water resources and infrastructure financing. In fiscal year 2008-2009 the SWIC met on the following dates:

July 8, 2008
August 12, 2008
September 9, 2008
October 21, 2008
November 12, 2008
December – no meeting
January 22, 2009
February 17, 2009
March 4, 2009 (HUC Sub-Committee)
March 20, 2009
April 17, 2009
May 15, 2009
June 19, 2009

The SWIC also met on the following dates in the current fiscal year. These are noted for the record as no additional funding for administrative support of the SWIC was included in the adopted State Budget for the current biennium. Utilizing funds saved from the 2006 appropriation extended for a three month period in to 2009-2010 fiscal year, the SWIC met on the following occasions and the efforts of the SWCI during that period are captured in this report:

July 17, 2009
August 21, 2009
September 18, 2009

## *Commission Work 2008-2009*

Work of the State Water Infrastructure Commission during this 15-month reporting period focused on the topics listed below. A summary of activities and recommendations put forward by the SWIC on ***Infrastructure Financing, Water Efficiency,*** and the ***Report of the Program Evaluation Division of Infrastructure Finance*** follow.

### *1. Infrastructure Financing*

The work of SWIC in support of infrastructure financing during this period focused on developing guidelines for local water systems to follow in setting rates adequate to support the system needs and on evaluating the adequacy of the current threshold established by the NC Legislature for eligibility to receive grant funds. A summary of these activities follows.

#### *a. Rate Guidelines for Setting Water Rates*

Session Law 2008-143, commonly known as "The Drought Bill" included a specific charge to SWIC for developing guidance on rate setting for local systems that included provision for system revenues meeting the costs of operation and servicing of any debt on the system. The law states in Section 17:

> **The State Water Infrastructure Commission, in consultation with the Department of Environment and Natural Resources, the School of Government at the University of North Carolina at Chapel Hill, the North Carolina Utilities Commission, the Public Staff of the North Carolina Utilities Commission, and the Local Government Commission, shall develop guidelines for water rate structures that are adequate to pay the cost of maintaining, repairing, and operating the system, including payment of principal and interest on indebtedness incurred for maintenance or improvement of the water system. The guidelines shall also consider the effect of water rates on water conservation and recommend rate structures that support water conservation. Copies of the guidelines shall be made available to the Department of Environment and Natural Resources, the North Carolina Utilities Commission, and to all local government water systems and large community water systems, as defined in G.S. 143-350. The Commission shall report to the Environmental Review Commission on its progress in developing the guidelines no later than January 1, 2009.**

Infrastructure assets, like all other "business" assets, depreciate in value over time. Efforts are underway in North Carolina by a host of professional organizations, non-profits and State regulatory agencies, to encourage local water systems owners to operate their systems as a business that provides a public service. This requires a move away from the older adopted practice of operating as a public service only which discounted the need to operate within a business model that is required in order to sustain the operation over time.

Operating within that business model, the accounting practices for North Carolina systems have been developed and adopted. These accounting practices are built on a business framework and title the water/sewer operations as an "Enterprise Fund" , implying that the operation of the enterprise will fall within the normal business practices of costs being recovered through the system revenues of rates and charges. Included in this model of accounting is the provision of depreciation of assets. Each year, assets that are used in conjunction with delivery of water and wastewater, such as the pipes, equipment, storage tanks, etc., are depreciating. By funding depreciation the system is able to set aside capital needed to replace these assets when they are fully depreciated or their useful life has expired. By setting rate and charges at a level to cover the operational needs, cover any debt service responsibilities and fund depreciation, a system can operate sustainably into the future.

Not only is this important to be prepared for periods of drought, but also for sustainable system operations under "normal" conditions. ***In its work this year, SWIC has focused on a response to the fact that a growing number of water/sewer systems are not financially sustainable.*** According to 2008 data submitted by system owners to the Local Government Commission, almost half (48 percent) of systems operate without funding depreciation. The actual fiscal challenge reaches deeper in certain systems. Many do not have rates and charges set to recover even the day-to-day operating expenditures of the system; others cannot cover debt service and operating expenditures without borrowing against their electrical fund, general fund or reserves.

To address the specific charge of the Drought Bill, SWIC contracted with the staff of the Environmental Finance Center (EFC) at the University of North Carolina at Chapel Hill – School of Government. Using information reported by local government systems to the NC Local Government Commission – NC Office of State Treasurer (LGC), the EFC staff proposed a series of means tests and applied them to the systems reporting information to the LGC in FY 2008. The "tests" included the following:

1. System operating revenues (money collected from customers for rates and fees) less than operating expenditures (costs to operate and maintain the system such as labor, chemicals, electricity, etc.).

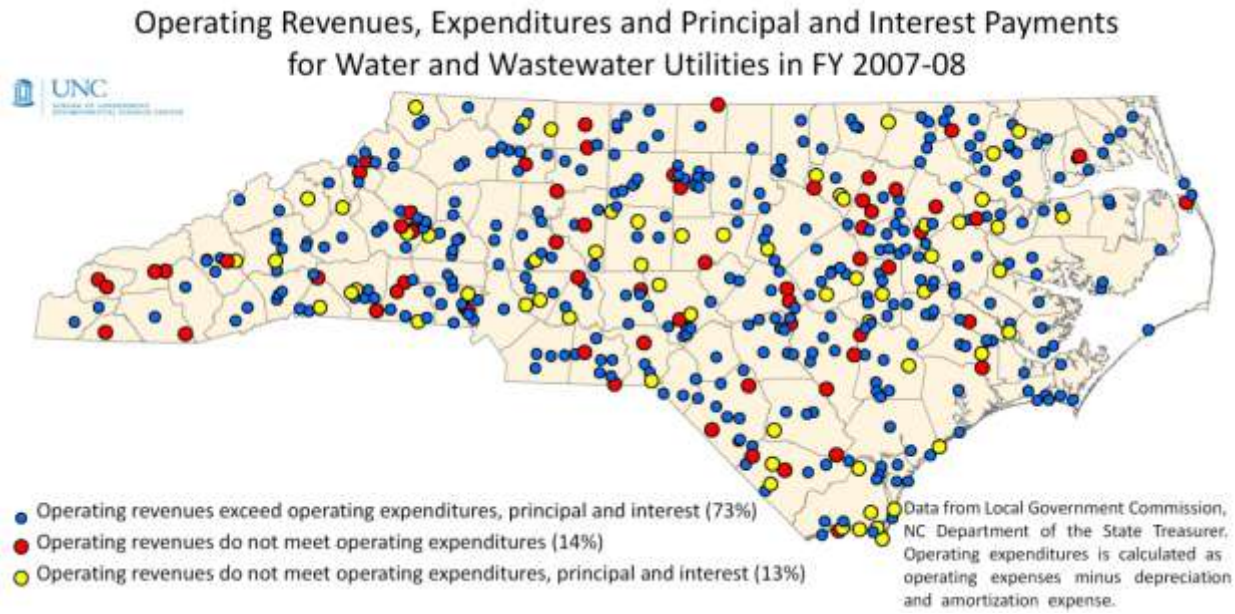
2. System operating revenues less than operating expenditures and debt service (principle and interest payment).

3. System operating revenues more than operating expenditures
    - Less than 50% of depreciation funded
    - 50-99% depreciation funded

Based on the application of these tests to the systems in the State, it was found that the operating revenues of 124 local government utilities or 27 percent of all local government water systems did not cover their operating expenditures and principal and interest payments during Fiscal Year 2007-08. Following debate and discussion which included the value of funding depreciation, the SWIC recommended that the State funders of water infrastructure – the Rural Economic Development Center, the NC Department of Commerce and the NC Department of Environment and Natural Resources – adopt the means test "2" above as a starting point. The map below shows the distribution of systems according to the tests above. A copy of the test rubric can be found as ***Appendix 1***.

***Recommendation***

Require all local government water systems applying for State financial assistance for water projects that include line extensions to expand the system to be fiscally sound and to have system revenues meet operating expenditures. This does not include funding of depreciation.



## *b. High Unit Cost Threshold*

The General Assembly set the State's "High Unit Cost Threshold" (HUC) as part of the Clean Water and Natural Gas Critical Needs Bond Act of 1998. The purpose of the figure was to establish a threshold at which systems applying for State funding to make infrastructure improvements would be eligible to receive State grant funds. The metric was tied to the Median Household Income of the applicant unit (the municipality or county). At the time this was adopted as part of the 1998 Bond Act, the designation of "High Unit Cost Threshold" was a name and number utilized by the NC Department of Environment and Natural Resources – Construction Grants and Loans Section, for use in qualifying North Carolina applicants for federal State Revolving Loan Funds. The 1.5 percent of Median Household Income meant that at a minimum, the local system receiving funds would need to have a combined water and sewer bill for a residential customer set so that it equaled 1.5 percent of the Census Median Household Income for that jurisdiction. If the applicant unit did not have rates set at a level to meet this threshold then they were not eligible for any available grant funds.

Using a threshold in this manner is a common practice in states across the country. These thresholds provide a means for a State to allocate scarce grant funds to those communities where low median household incomes can make a needed project unaffordable to the residents if the full cost of the project were carried in loan funds only. By infusing grant funds into the project in the amount necessary only to bring the fair share cost of the project down to an amount equal to 1.5 percent of the Median Household Income of the residents, the project is deemed "affordable". A corresponding rate of .75% was also set for systems that only had a water utility.

In its 2008 Annual Report to the Governor and General Assembly the State Water Infrastructure Commission (SWIC) committed itself to determining whether after eleven years an increase in the HUC threshold would be appropriate and if so, how much of an increase would be appropriate. A High Unit Cost Sub-Committee was created including Robin Smith (NCDENR), Ellis Hankins (NCLM), Patrick Woodie (NCREDC) and Chairman Holman.

### *SWIC Review and Evaluation of HUC Threshold*

Several factors guided SWIC's review of the High Unit Cost (HUC) Threshold. First, the costs associated with owning and operating water or wastewater systems have increased significantly since the State's HUC threshold was adopted. These include costs for operation and maintenance – pipes, equipment, labor and fringes, electricity, chemicals - as well as

costs of financing. Second, the volume of grant funds available from both the State and Federal governments has decreased dramatically. Third, according to information available from the NC Local Government Commission, almost half of the systems in the State operated with revenues less than expenses (including depreciation) in 2008. Finally, it had been eleven years since the threshold was established and a review of adequacy was needed.

To assist with the evaluation, the SWIC retained the assistance of the staff at the UNC Environmental Finance Center and the SWIC staff. A history of use of the threshold by the Federal Government was documented and a review of the threshold applied to all municipal and county water and sewer system owners/operators in the State was conducted. Data for this portion of the work was taken from the Annual Survey of Rates and Charges conducted by the NC League of Municipalities in concert with the Environmental Finance Center.

The results of the history of use of the threshold revealed that the Federal Government, in the ten years since the State of North Carolina adopted the 1.5 percent threshold, had raised its recommendation for threshold to 2.5 percent each for water and wastewater, or a combined 5 percent of MHI. The review also found that numerous states across the country are using a higher threshold, some as high as 7 percent, to reflect the increased costs of owning and operating a water/sewer system.

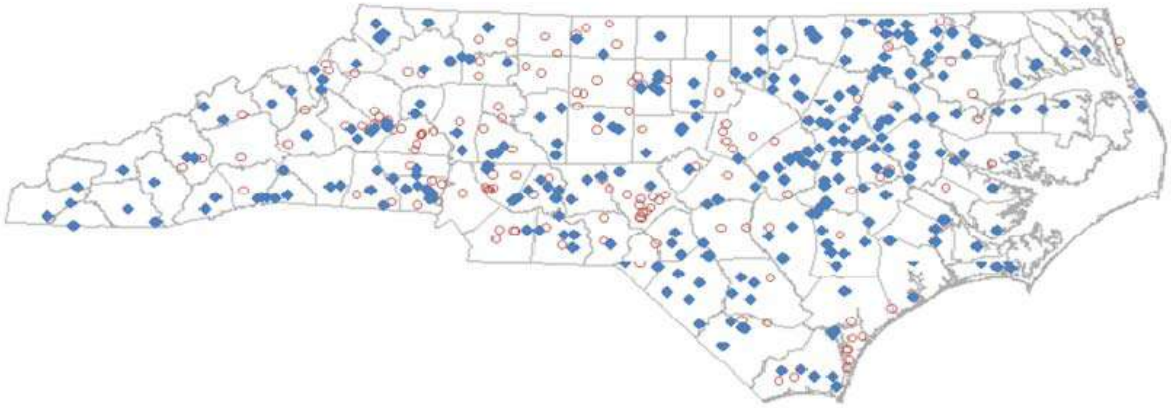
Efforts of the Environmental Finance Center at UNC-Chapel Hill determined (using rate data current as of January 2009) that 67 percent of NC water systems would qualify for high unit cost grants if the threshold remains at 1.5% for combined water and wastewater systems. If the threshold were increased to 2 percent, then 56 percent of NC water systems would qualify for high unit cost grants.

Concerned about the impact of the move in the threshold for communities with high rates of poverty, the Sub-Committee also looked at this threshold with a modifier where communities with poverty rates equal to or greater than the State's 2000 poverty rate (12.3 percent) would drop back to the 1.5 percent threshold.

The graphics on the following page illustrate the comparison.

If the affordability target remains at **>= 1.5% MHI for combined water and wastewater bills** for 5,000 GPM (ignoring water-only systems):

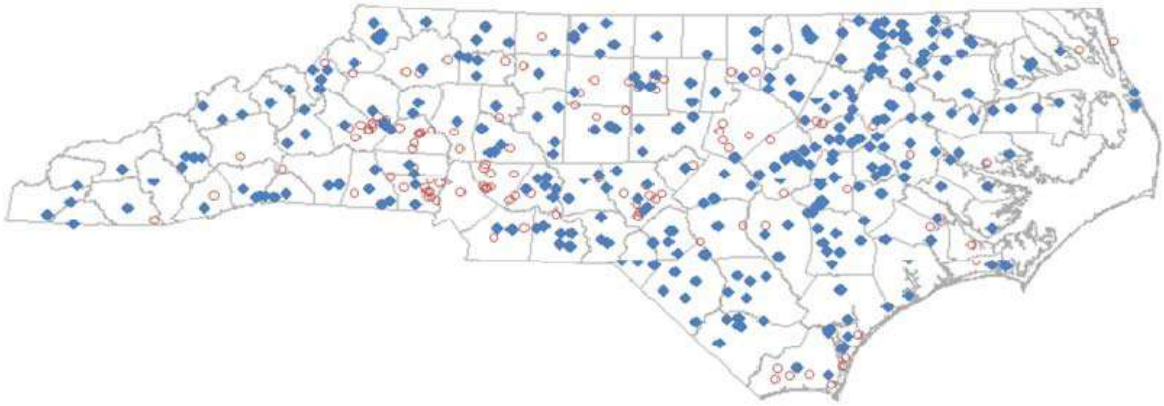
282 out of 421 (67 percent) of water systems qualify (shown as Blue Diamonds)



Source: EFC Research for SWIC – High Unit Cost Threshold, 2009

If the affordability target is adjusted up to **>= 2.0% MHI for combined water and wastewater bills** for 5,000 GPM (ignoring water-only systems)

237 of 421 (56 percent) of water systems qualify (shown as Blue Diamonds)



Source: EFC Research for SWIC – High Unit Cost Threshold, 2009

***Recommendation***

The SWIC recommends that the General Assembly increase the high unit cost threshold to 2.0% for combined water and wastewater systems and 1.0% for systems operating a single water or wastewater utility and having a poverty rate of less than 12.3% and should retain the high unit cost threshold at 1.5% for combined water and wastewater systems and 0.75% for water or wastewater systems with a poverty rate of 12.3% or greater, effective July 1, 2010.

- That a common understanding and practice of determining whether a system meets this threshold should include the use of the most recent decennial census figure for poverty for the community with by the update factor now available from the US Department of Housing and Urban Development. The updated Census number is not utilized uniformly by all State funders.

- That the SWIC will work to develop other criteria to determine affordability and to identify troubled or unsustainable water systems and will report to a future session of the General Assembly.

- That this resolution does not apply to the economic development programs administered by the NC Department of Commerce and the NC Rural Economic Development Center which are intended to create and retain jobs

A resolution outlining these recommendations was distributed to Legislative Members following its adoption. A copy of the resolution can be found as ***Appendix 2***.

## *c. Funders Forum*

The North Carolina Funders Forum is a loosely organized consortium of State and Federal funders of drinking water, wastewater and stormwater infrastructure. The group has been in existence since the early 1980s when the Rural Economic Development Center sponsored the first meetings of the group.

The purpose of the Funder's Forum is to provide a place and time for funders to share information, ideas and current knowledge of approaching change in the funding priorities

and goals of each agency represented. In sharing information, it has been established that projects seeking funding have been able to secure the combination of funds available for their project with less time investment than through meeting with each funder individually. To this end, the Funder's Forum has sponsored a series of "Funding Fairs" regionally across the State.

As a result of the Program Evaluation Divisions Report on Infrastructure Funding, the Funders Forum submitted a letter to the Co-Chairs of the Joint Legislative Program Evaluation Oversight Committee outlining five strategies to increase coordination among the water and wastewater agencies. One strategy was the development of a "common application" that all appropriate state funding agencies will use as a part of their application process. The Funders Forum reviewed the different applications used by state funding agencies and pulled out the common information requested by all of the agencies to become a new ***Section 1*** for all funding applications. The use of the "common application" will improve project coordination among agencies and will enable agencies to provide more comprehensive reporting on all the water and wastewater projects in the state. The Funders letter that outlines five specific ways to increase coordination among agencies is attached to this report as ***Appendix 3***.

The SWIC has supported the work of the Funder's Forum and sought the advice of the group on a number of matters under its consideration.

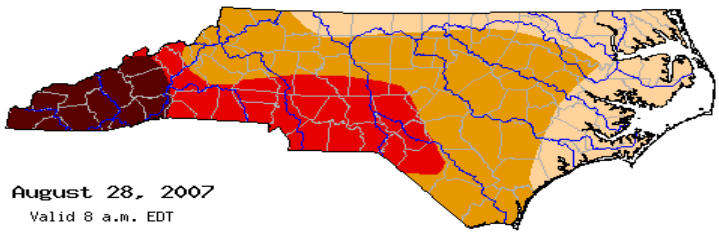
## *d. Water Efficiency*

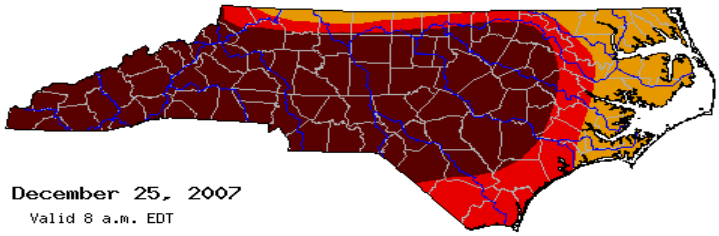
With the Droughts of 2002 and 2007 and newly released population estimates for the State as a backdrop, the SWIC committed to develop a set of recommendations for the State decision-makers on enhancement of Water Efficiency.

As the State Water Infrastructure Commission released its Annual Report in November of 2007, the consequences of the ongoing drought were brought into clear focus. By the end of December 2007, 67 counties were designated as under "exceptional drought", the most severe of the drought designations. Another 20 were in extreme drought and 13 in severe drought. [1]

This drought of 2007 was more remarkable than the recent drought of 2002, not only because all 100 counties in the State of North Carolina were affected, but because of the speed with which the drought progressed. Within four months, as shown by the graphics below, the drought had spread across the State, engulfing 55 additional counties in exceptional drought conditions. The maps below, taken from the NC Drought Advisory Council website illustrate the speed at which this drought accelerated.

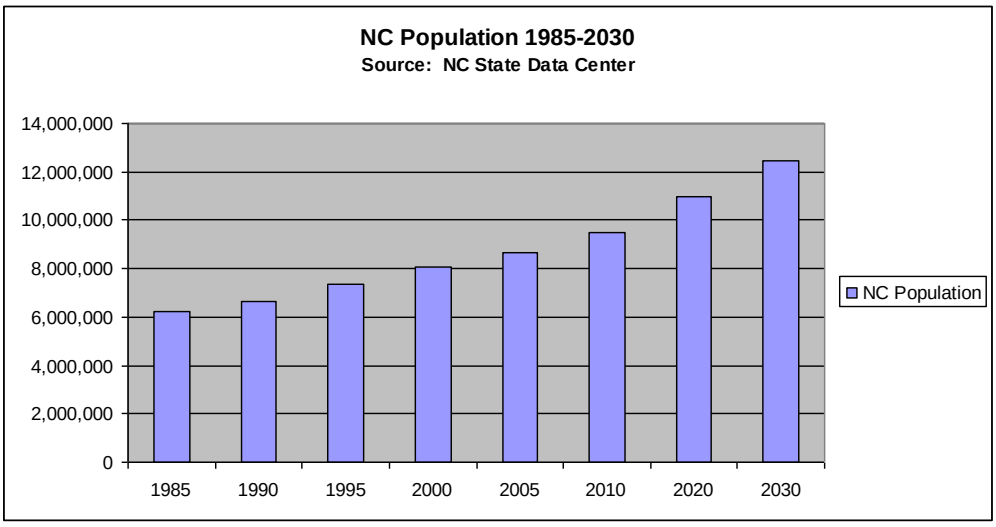
**Comparison of Extent of 2007 Drought August to December 2007**




Source: NC Drought Council Website

For most systems, this drought amplified the already apparent challenge of meeting the water demands for a growing population. Population growth in North Carolina has exceeded population growth in the nation as a whole since the year 2000. In the twenty year period between 1985 and 2005, North Carolina's population grew by 39 percent. Growth through 2030 calculated by the State Data Center shows an expected 30 percent increase in population between 2010 and 2030, bringing the State's population to more than 12 million people (see below).




In response to the severity of the 2007 drought, the Governor took unprecedented action on behalf of the State by calling for supply side conservation. Prior responses had focused on efforts to reduce consumption of water by the users. These new efforts focused attention on how the water systems could become more efficient in their own use of water. For many systems this was the first time attention was placed on the reduction of water use on the supply side. Water audits, leak detection and conservation pricing became regular parts of the conversation on how North Carolina would deal with its most severe drought.

## *Work of SWIC on Water Efficiency*

- SWIC convened three separate panels of professionals representing agriculture, local government water managers, industry, trade groups and State regulators to discuss and debate the merits of enhanced water efficiency for the State.
- SWIC observed that being "water efficient" places a different lens on our water use. It challenges us to reduce the waste of water, to find better, more effective ways of doing things and to make behavioral changes in the way we use water.

- SWIC observed that we have distinct choices how we meet both current and future demand. Water systems across the State are making choices today regarding where their next increment of water will be found. Population growth and concentration, increasing regulation of drinking water, wastewater and stormwater and unpredictable variations in weather and climate all serve to drive up the cost of water and push us forward into developing new supplies. When local water systems respond to these conditions by finding ways within their own operation to reduce waste, it can help stabilize costs and defer the development of new supplies further into the future. By using water more efficiently, both drinking water systems and customers can help preserve water supplies for future generations, save money, and protect the environment.
- SWIC served as a forum for discussion and debate on the proposed 2008 drought legislation. In its final, adopted version (Session Law 2008-143), the Drought Rules contained eligibility requirements as recommended and supported by SWIC for local government water systems desiring to secure state financial assistance.

## *Efficiency Tools Examined by SWIC*

SWIC examined three water efficiency tools: ***Water Audits and Leak Detection, Reclaimed Water, Asset Management and Water Rates/Rate Structures.*** Each alone has the potential to increase water efficiency. Together, as part of an overarching policy shift by the State on water efficiency, they have potential to change the way we think about and value our water resources. A summary of work and recommendations of SWIC on each follows.

### *a. Water Conservation Rates*

The drought bill also directed SWIC to develop guidelines for water utilities to encourage water conservation. The research was designed to study the relationships between water usage for specific utilities and the following: pricing signals, rate structures, billing periods, the application of voluntary and/or mandatory watering restrictions, utility demographic data, climate data and other factors that are likely to influence usage. Work on these guidelines has begun and will be completed in the 2009-2010 fiscal year if funds are available.

## *b. Water Audits*

With newly defined emphasis by the State on water efficiency from the system or "supply side", the SWIC held discussion on how to best support water systems in becoming more efficient. The SWIC convened a Water Audit Sub-Committee which included members from the State agencies, trade groups, consulting engineers, and local water systems. The group was charged with determining the best methods/tools available to estimate water efficiency in local systems and evaluating those to make certain they apply equitably to all systems.

***Recommendation of the Sub-Committee adopted by the SWIC:*** The Sub-Committee reported and the SWIC subsequently adopted the recommendation that the while the audit standard developed by the American Water Works Association was the new "industry standard" that it may be too complex for small systems to utilize. Therefore, a modified version of the standard was recommended. The full AWWA standard is shown below:

AWWA Water Audit Format:

<table>
<tr><td rowspan="8">System Input Volume (corrected for known errors)</td><td rowspan="3">Authorized Consumption</td><td rowspan="2">Billed Authorized Consumption</td><td>Billed Metered Consumption (including water exported)</td><td rowspan="2">Revenue Water</td></tr>
<tr><td>Billed Unmetered Consumption</td></tr>
<tr><td rowspan="2">Unbilled Authorized Consumption</td><td>Unbilled Metered Consumption</td><td rowspan="6">Non-Revenue Water (NRW)</td></tr>
<tr><td>Unbilled Unmetered Consumption</td></tr>
<tr><td rowspan="5">Water Losses</td><td rowspan="3">Apparent Losses</td><td>Unauthorized Consumption</td></tr>
<tr><td>Customer Metering Inaccuracies</td></tr>
<tr><td>Data Handling Errors</td></tr>
<tr><td rowspan="3">Real Losses</td><td>Leakage on Transmission and Distribution Mains</td></tr>
<tr><td>Leakage and Overflows at Utility's Storage Tanks</td></tr>
<tr><td>Leakage on Service Connections up to point of Customer metering</td></tr>
</table>

***Rationale for Recommendation:*** It is notable in that this new methodology moves thinking away from calculating how much water is "lost" to developing a greater understanding of the end points of water use. It is also notable that it provides a way to calculate the value of

water that fails to produce revenue and a greater understanding of costs and benefits – the economic value – of making various repairs to the system

Following discussion, the SWIC adopted a position of support for the use of a standardized water audit format in North Carolina. SWIC determined that having a format adopted for use North Carolina in conjunction with the Local Water Supply Plans would increase the utility of the information gathered by the Division of Water Resources. SWIC found that no policy barriers currently existed to deter this modification. The SWIC recognized the utility of the updated IWA/AWWA model but acknowledged that the model was developed for most useful application in large water systems, and required information that many of the State's smaller systems likely would not be able to produce. Thus, the SWIC recommends adoption of the IWA/AWWA model as a guideline for development of a North Carolina water audit format and requested that the State Department of Environment and Natural Resources develop the modified document in consultation with other interested parties.

### *c. Leak Detection and Repair*

The growing emphasis on efficient management of our State's water resources spurred particularly by the droughts and growing water demand took root most effectively in leak detection in drinking water systems. Both detecting water leaks and the follow-up repairs are supply-side management strategies- those which can be employed by the water system owner to enhance the efficiency of operations.

Many municipal and county water systems have moved forward with water audits which provide a basis for understanding the volume of unaccounted for water and the impact that water "loss" has on the finances of the system. Leak detection and repair are the next logical step, providing the system owner with a precise location of leaks, and when coupled with information from the water audit, the priority order for repair that achieves the greatest cost and water savings.

The SWIC worked with NCDENR in developing a State approach to water audits and to introducing leak detection technology and process to local water systems. Attached in ***Appendix 5*** is a copy of the State guidance developed for local systems to follow when addressing the Leak Detection Requirement now attached to State funding for drinking water projects.

### *d. Reclaimed Water*

Water Reuse – also known as reclaimed water - involves the use of highly-treated wastewater as a substitute for treated drinking water for end uses that do not require potable water quality. In accordance with State and Federal regulation, drinking water systems must be sized to meet peak demand. Meeting the peak demand often drives the development of new supplies and infrastructure investments. If peak demand can be reduced through increasing the efficiency of use, the sustainability of the system and the resources is supported.

To gain an understanding of the current policy and practice of water reuse, the SWIC conducted its own research and also invited professionals in the water industry to provide their perspectives. SWIC sponsored a series of three panel discussions on water reuse and reclamation which were open to the public and drew significant attendance. The interests represented in the panels included Public Health, Agriculture, Industry, Local Governments already employing water reuse as part of their water management programs, the State of North Carolina represented by officials from the Department of Environment and Natural Resources (DENR) and members and Chair of the North Carolina American Water Works Association (AWWA) Water Reuse Committee.

These panel discussions provided key support to the Department of Environment in proposing expansion of the water reuse law in North Carolina. The SWIC 2008 Annual Report focused on the value of and impediments to expanded use of reclaimed water and other water efficiency measures in the State.

To date, the DENR staff have received approval of the fiscal note attached to the proposed rule changes for water reclamation. Staff is currently working on establishing the dates for the required public hearings and anticipates holding the hearings starting in late February 2010.

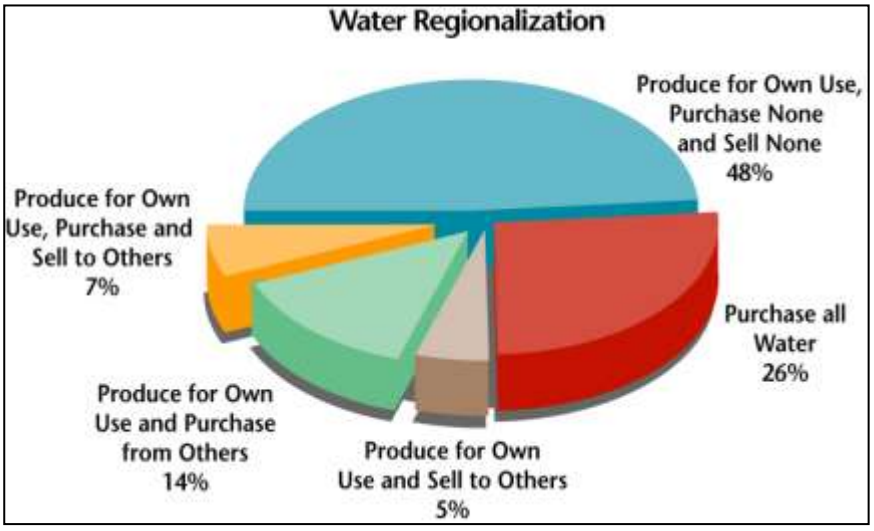
**Recommendation of the SWIC on Reclaimed Water:** The members of the State Water Infrastructure Commission support the expanded use of reclaimed water, gray water, harvested rain water and stormwater subject to adequate provisions to protect public health. The SWIC has adopted a resolution in support of the use of reclaimed water which it has distributed to the Governor, members of the North Carolina General Assembly and others. The SWIC supports the proposed rule enhancements for reclaimed water which are currently being considered by the EMC. SWIC notes with concern the inconsistencies in regulatory treatment of gray water, harvested rainwater, stormwater and reclaimed water and supports the timely reconciliation of these differences.

## *e. Regionalization*

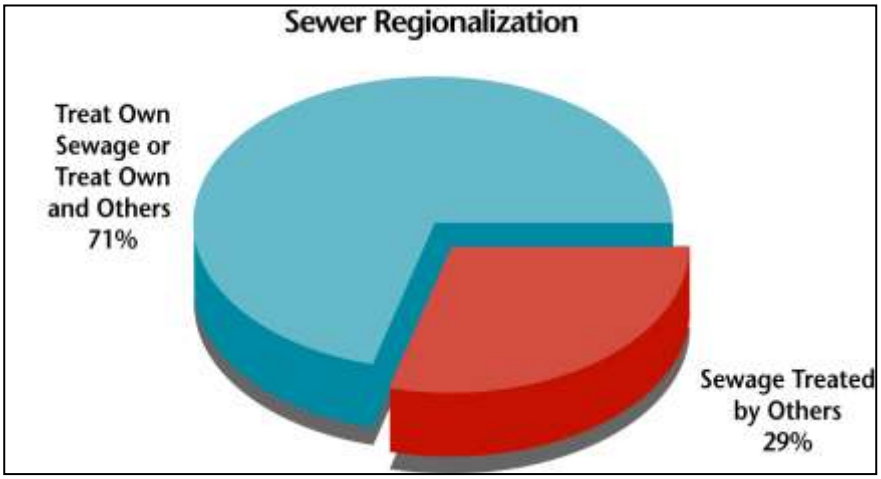
In the United States and abroad, regional cooperation among utility providers is used to increase efficiency of system operations, join systems together to enjoy economies of scale that otherwise might not be enjoyed by those members, and to provide service to areas that would not otherwise receive service. Regionalization, regional collaborations and partnerships take many forms and provide a variety of services to North Carolina drinking water and wastewater systems.

In keeping with its charge to provide recommendations on the role of the State government in the development and funding of wastewater, drinking water, and storm water infrastructure, the State Water Infrastructure Commission (SWIC) examined the concept and practice of regionalization in North Carolina. Through panel discussions and individual presentations, SWIC members heard from a variety of presenters including those that fund infrastructure in North Carolina and owners/operators of several of our largest regional systems.

Given the confluence of factors placing pressure on the safe operation of our state's infrastructure systems and highlighting our need for water resource planning and management statewide, the Commission sees regional collaboration as an important strategy/practice that may offer near-term benefit to the State. Without exception, funders and those that manage these regional systems see regional collaboration as an essential component of our State's strategy for enhanced resource management. A common thread running through all discussions and presentations was that State policy could do more to support regional collaborations. The graphics below show the extent of physical interconnection between drinking water and wastewater systems as of 2003.




**Source: NC Rural Center, Water 2030 Report**




**Source: NC Rural Center, Water 2030 Report**

**Outcomes of SWIC work on Regionalization:**

DENR through the Public Water Supply Section contracted with the UNC Environmental Finance Center to provide public water system capacity development support. One of the deliverables from this contract was to provide an inventory of water system partnerships, interconnections and the institutional agreements that control their usage. This information is available from the Environmental Finance Center's Web site at the following Uniform Resource Locator (URL). Information can be found at the following location: http://www.efc.unc.edu/projects/partnerships.htm#inventory.

**Recommendations of SWIC on Regionalization:** Support the development of regional infrastructure partnerships through direct State investment in policy development, funding, and technical assistance through the following:

- Develop and implement a set of criteria for evaluating system "readiness" for regionalization. This may prevent bringing systems that are not ready i.e., not yet managing their systems efficiently and effectively, into a regional configuration where they cannot participate as an equal.
- Fund a study to identify the most promising regions for water regionalization that could then inform local decision makers, funders and the public.
- Provide Start-Up funding for regional projects to match local investments for the engineering, planning and legal work associated with forming a regional entity.

## *f. Asset Management*

The Environmental Protection Agency defines asset management as "managing infrastructure capital assets to minimize the total cost of owning and operating them, while delivering the service levels customer's desire. Each utility is responsible for making sure that its system stays in good working order-regardless of the age of components or the availability of additional funds. Asset management programs with long-range planning, life-cycle costing, proactive operations and maintenance, and capital replacement plans based on cost-benefit analyses can be the most efficient method of meeting this challenge." (EPA website)

Asset Management entails maintaining an up-to-date inventory of water and wastewater assets and planning for the repair and replacement of those assets. It makes good sense and provides a means by which local systems can stay ahead of the "aging infrastructure" game. However, as discovered in the Water 2030 Initiative, few North Carolina systems – particularly smaller systems- have an active inventory or an Asset Management Plan.

Following logically along with the work on water audits and leak detection and repair, the SWIC supports Asset Management as a strategic water efficiency practice. SWIC appointed a sub-committee (Task Force) to begin an assessment of the current educational and technical assistance efforts at the State level and a look at gaps in education and technical assistance specific to asset management.

Attached in ***Appendix 4*** is a copy of the meeting summary of the Asset Management Task Force.

## *e. Program Evaluation Division Report on Infrastructure Funding*

In January 2009 the Program Evaluation Division of the NC General Assembly released its report assessing the focus and coordination of State funding for water, wastewater and stormwater infrastructure. The Program Evaluation Division is a central, non-partisan staff unit of the Legislative Services Commission of the North Carolina General Assembly which assists the General Assembly in fulfilling its responsibility to oversee government functions. The mission of the Program Evaluation Division is to evaluate whether public services are delivered in an effective and efficient manner and in accordance with the law. (Website) The report entitled, ***Report No. 2008-12-07: NC's Water and Wastewater Infrastructure Funding Lacks Strategic Focus and Coordination***, can be found on the NCGA website at http://www.ncga.state.nc.us/PED/Reports/RecentReports.html.

Directed by the North Carolina General Assembly's Legislative Program Evaluation Oversight Committee, the Program Evaluation Division (PED) conducted research on the six (6) State funding programs for infrastructure, "to determine the effectiveness of the current allocation system and to identify funding alternatives for infrastructure improvements." (Executive Summary, PED Report) In addition to the six State funders, the State Water Infrastructure Commission was also evaluated to determine how well it had met its intended mission.

The PED Report concluded that the system for funding was duplicative and uncoordinated and that without an oversight agency or a strategic plan to guide activities, water and wastewater funding was provided in a complex and fragmented manner. (PED Report)

The PED Report also concluded that the State Water Infrastructure Commission, had fallen short of achieving its mission of identifying the state's water infrastructure needs and developing a plan to meet those needs. The PED Report stated that this was attributable to the fact that the SWIC did not have the necessary funding or authority to deliver on the legislative charge.

The PED Report recommended that the General Assembly should consider the following actions:

- Direct the State Water Infrastructure Commission to develop a statewide strategic plan and needs assessment for water and wastewater infrastructure by May 1, 2010;

- Require better oversight of water and wastewater funding by either authorizing the State Water Infrastructure Commission to coordinate and oversee the system or by establishing a single water and wastewater authority;

- Using state loan program and relying less on grants when determining state appropriations for water and wastewater infrastructure. (Executive Summary – PED Report)

## *SWIC Response to PED Report*

Since the spring of 2006 when it was appointed and organized the SWIC has provided a monthly forum for communication, collaboration, and cooperation for state and federal funders of water infrastructure, local governments and other interested parties. I believe the SWIC has successfully increased the communication, cooperation and collaboration among funders and other agencies.

With its limited resources and authority SWIC has chosen to focus on increasing cooperation rather than developing a strategic water infrastructure financing plan. In order to develop a strategic water infrastructure financing plan SWIC or any other agency would need clearer goals and objectives from the Governor and/or General Assembly. SWIC does not have the authority and has not sought the authority to require funders or other agencies to comply with what it considers best practices.

In a letter to the Joint Legislative Committee Chairs in January 2009, the Chairman responded on behalf of SWIC to state, "I believe that inconsistent funding has resulted in the lack of a statewide strategic plan more than the lack of a plan has caused inconsistent funding. State and local roles in planning, financing, constructing, operating and maintaining other significant infrastructure, including public schools, community colleges, universities, transportation and even parks, is relatively well defined. The State role in water infrastructure is not well defined. In good economic times the General Assembly has been generous in its funding for water infrastructure. The General Assembly's support has been important because national funding for EPA's drinking water and wastewater programs has decreased. The SWIC has advocated for a dedicated source of state funding for water infrastructure to be matched with local water, wastewater and stormwater revenues." (SWIC Response Letter to PED Report, January 2009)

In that correspondence, three **recommendations** were offered:

1) SWIC would appreciate the opportunity to develop a statewide strategic plan and needs assessment for water and wastewater infrastructure funding by May 2010. The General Assembly should set the goals that it desires the plan to achieve. The plan should include stormwater and other "new" sources of water such as that found with reclaimed water. SWIC would also appreciate the opportunity to assist in the development of regional strategic plans based on river basins. Further, SWIC would

oppose transferring funds from the Rural Center and CWMTF to pay for planning and would support an appropriation from the General Assembly instead.

2) Over time the General Assembly has created a decentralized system of meeting different water and wastewater needs. SWIC believes that it is appropriate and timely to discuss, debate, and consider alternatives to our current system. SWIC would welcome an opportunity to consider improving oversight and coordination.

3) EPA and USDA primarily provide low interest loans for water finance. SWIC could work with funders, the Local Government Commission, and the General Assembly to establish clearer state policies regarding the investment of state funds. Specifically, the state would benefit from clearly defined state policy on the funding of infrastructure improvements. Specifically, this should include guidance on the level of state assistance when the high unit cost threshold now established in NCGS 159G-20 is exceeded. Related to this topic, the SWIC would decide whether to recommend the existing high unit cost threshold of 1.5% of median household income be increased to the 2009 General Assembly.

## *General Assembly Action Following Release of PED Report*

Although bills to implement the recommendations of the PED Report were introduced, the 2009 General Assembly did not act upon them.

The General Assembly appropriated no funds for SWIC to operate in 2009-2011.

The General Assembly authorized a legislative study committee on water and wastewater infrastructure in the Studies Act of 2009 (Part XLIII of SL 2009-574).

# Appendices

# *Appendix 1*

**Rate Design Guidelines per Drought Bill**
**Draft Presented to SWIC by UNC Environmental Finance Center**
**6/19/09**

**Cost Recovery**

1. Data sources
    a. Last available audited financial report from the Local Government Commission database
    b. Last approved annual budget
    c. Approved multi-year capital investment plan and/or budget
    d. Multi-year financial plan
2. Definitions
    a. Annual operating expenditures
    b. Annual operating revenue
    c. Annual interest payment
    d. Annual principal payment
    e. Depreciation
    f. Fund transfer
    g. Reserves
    h. Fixed cost
    i. Variable costs
    j. Asset management
3. Revenue tests
    a. Operating revenues less than operating expenditures
    b. Operating revenues less than operating expenditures and debt service (principle and interest payment)
    c. Operating revenues more than operating expenditures
        i. Less than 50% of depreciation funded
        ii. 50-99% depreciation funded
4. Corrective measures/justification
    a. Immediate rate increase
    b. Documentation showing future revenue projections
    c. Plan showing steps being taken to assure water system is sustainable
        i. Approved rate increase program
        ii. Approved multi-year financial plan
        iii. Existence of reserve funds

**Conservation Oriented Rates**

1. Data sources
    a. Rate structures
    b. Water shortage vulnerability
        i. Drought status
        ii. Safe yield
        iii. Unused water treatment capacity
        iv. Unused wastewater treatment capacity
2. Definitions
    a. Fixed charge
    b. Commodity charge
    c. Block structure
        i. Decreasing
        ii. Uniform
        iii. Simple Increasing
        iv. Seasonal
        v. Water budget
    d. Marginal price
    e. Average price
    f. Average bill
    g. Temporary water shortage rates (drought surcharge)
3. Anticipated conservation impact of rates tests
    a. Block structure
    b. Average price (5 K, 15 K for water only and combined water and wastewater)
    c. Price of next 1,000 gallons (marginal price) (5 K, 10K, 15 K)
    d. Percentage change in bill of next 1,000 gallons (5K, 10K, 15K)
    e. Price of next 5,000 gallons (5K to 10 K)
    f. Percentage change in bill of next 5,000 gallons (5K)
    g. Billing period
    h. Bill information
4. Measures
    a. Increase rates
    b. Reduce water productions
    c. Rate structure change
    d. Adoption of water shortage rate program
5. Conservation revenue vulnerability test
    a. Historic usage analysis
    b. Historic revenue analysis
    c. Percentage of revenues generated from fixed charge component
    d. Days cash on hand/fund reserve
    e. Operating Revenue/Operating Expenditure

*Appendix 2*

## Resolution by State Water Infrastructure Commission Increasing the Median Household Income/High Unit Cost Threshold In Order to Apply for Water Infrastructure Grants

**Whereas** the 1998 General Assembly enacted SL 1998-132, Clean Water and Natural Gas Critical Needs Bond Act of 1998, by Senator John Kerr and others, and established 1.5% of median household income as the high unit cost threshold in order for combined water and wastewater systems or 0.75% of median household income for water or wastewater systems to apply for water infrastructure grants; and

**Whereas** many water and wastewater systems raised their rates in order to compete for high unit cost grants and to raise revenues to operate and maintain their systems; and

**Whereas** the 2005 General Assembly codified the high unit cost threshold at 1.5% for combined water and wastewater systems and 0.75% for water or wastewater systems in SL 2005-454, Clarify Clean Water Funding; and

**Whereas** the State Water Infrastructure Commission in its 2008 Annual Report to the Governor and General Assembly committed itself to determining whether and if so, how much to increase the median household income threshold used for determining grant eligibility; and

**Whereas** with assistance from the Environmental Finance Center at UNC-Chapel Hill the SWIC determined that 67% of NC water systems would qualify for high unit cost grants if the threshold remains at 1.5% for combined water and wastewater systems and that 56% of NC water systems would qualify for high unit cost grants if the threshold was increased to 2.0% for combined water and wastewater systems with a poverty rate of less than 12.3% and the threshold was maintained at 1.5% for combined water and wastewater systems with a poverty rate of 12.3% or greater; and

**Whereas** the SWIC recognizes that it is difficult for local elected officials to increase water and wastewater rates and that high unit cost threshold is a strong incentive for local elected officials and water systems to raise their rates to cover their operating and maintenance costs; and

**Whereas** according to audit data submitted by water systems to the NC Local Government Commission almost half (48 percent) operated with expenses greater than revenues in 2008; and

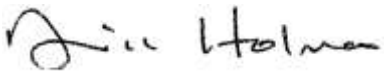
**Whereas** state policy should support local elected officials and water systems that are willing to raise their water rates to sustain their water systems.

**Now, therefore be it resolved** by the State Water Infrastructure Commission meeting in Raleigh, North Carolina on May 15, 2009:

The General Assembly of North Carolina should increase the high unit cost threshold to 2.0% for combined water and wastewater systems and 1.0% for water or wastewater systems with a poverty index of less than 12.3% and should retain the high unit cost threshold at 1.5% for combined water and wastewater systems and 0.75% for water or wastewater systems with statewide individual poverty index or greater as determined by the last decennial census index (currently 12.3% poverty ), effective July 1, 2010.

The SWIC will work to develop other criteria to determine affordability and to identify troubled or unsustainable water systems and will report to a future session of the General Assembly.

This resolution does not apply to the economic development programs administered by the NC Department of Commerce and the NC Rural Economic Development Center which are intended to create and retain jobs.



Bill Holman
Chairman

NCDENR

North Carolina Department of Environment and Natural Resources

Beverly Eaves Perdue, Governor

Dee Freeman, Secretary

February 26, 2009

Representative James W. Crawford, Jr.
Co-Chair, Joint Legislative Program Evaluation Oversight Committee
North Carolina General Assembly
Legislative Building
16 West Jones Street
Raleigh, NC 27601

Senator Daniel G. Clodfelter
Co-Chair, Joint Legislative Program Evaluation Oversight Committee
North Carolina General Assembly
Legislative Building
16 West Jones Street
Raleigh, NC 27601

Senator Fletcher L. Hartsell, Jr.
Co-Chair, Joint Legislative Program Evaluation Oversight Committee
North Carolina General Assembly
Legislative Building
16 West Jones Street
Raleigh, NC 27601

Gentlemen:

We are writing to you today in follow up to the Program Evaluation Division's report to the Joint Legislative Committee regarding water and wastewater infrastructure funding. One of the main points of discussion in the report and at the meeting concerned the need for greater coordination of activities among the different funding entities. While each of our programs was created to meet a specific statutory purpose, we also understand the value of coordinating our activities to be more efficient, to improve project management, and to provide more complete and understandable information on progress made toward meeting the state's water and wastewater infrastructure needs.

Our agencies have discussed ways to increase coordination of our water and wastewater infrastructure funding activities. Recognizing that our agencies are charged by the General Assembly to address different needs, our goal is to do so in a manner that adds value to each agency, minimizes the burden on applicants and provides clear and

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complete information on the performance of our funding programs. We identified five specific ways to accomplish this goal without increased bureaucracy or cost:

1. Develop a common first page for grant and loan applications. The intent is to create a single template for project descriptions that will make it easier to identify and coordinate on projects that request funding from multiple agencies, as well as to streamline the application process for applicants.
2. Schedule regular joint meetings of the funding agencies to share water and wastewater funding opportunities with potential applicants. This is an approach that the funding agencies have used periodically in the past, most recently to help water systems identify funding for drought response projects.
3. If a project receives funding from multiple state funding sources, we propose to exchange progress reports and site visit information among the funding agencies. Our agencies believe that there are opportunities for programs that jointly fund a particular project to also share and improve oversight responsibilities.
4. In addition to preparing our individual program funding reports for the General Assembly, each agency would share a copy in a common format with the State Water Infrastructure Commission. SWIC could then merge the information into a single annual funding report on all water/wastewater funding activities. A single report will make it much easier for both the General Assembly and the public to understand and evaluate water/wastewater funding activities.
5. Examine the needs assessment that is currently done by the Environmental Protection Agency (EPA), the needs survey done by DENR, and the Water 2030 data to determine what all the assessment tools tell us and where there may be gaps in the data in order to begin the process of developing a statewide needs assessment.

Our agencies are currently working to develop a document further defining our ideas for improved coordination and to ultimately sign a Memorandum of Understanding between our agencies adopting these coordination recommendations. We expect to have a more detailed document to share with you very soon.

Sincerely,

Dee Freeman
Secretary of Environment and Natural Resources

J. Keith Crisco
Secretary of Commerce

Billy Ray Hall, President
N.C. Rural Economic Development Center

Richard Rogers, Executive Director
Clean Water Management Trust Fund



Cc: Representative Joe Hackney, Speaker of the House
Senator Marc Basnight, President Pro Tempore of the Senate

# *Appendix 4*

CAVANAUGH

*Solutions through integrity and partnership*

## SUMMARY OF MEETING

**DATE:** May 11, 2009

**TIME:** 3:00 p.m.

**PARTICIPANTS:** Steve Cavanaugh – SWIC
Sharon Edmundson – State Treasurer's Office
Dennis Ramsey – NCDENR – Division of Water Resources
Linwood Peele – NCDENR - Division of Water Resources
John McFadyen – NCDENR Public Water Supply

**RE:** SWIC Asset Management Task Force

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Steve opened the conference call by explaining that although we were likely to have a limited group on the call at this first meeting, it was important to get started and outline some broad concepts relative to Asset Management and to keep those who were not able participate informed by email.

Steve explained that the intent was to have a large cross-section of members who were interested in Asset Management, ranging from the members of SWIC, members of funding agencies and representation from small, medium and large systems. The members who have been contacted and expressed their interest include:

- Bill Holman – SWIC
- Downey Brill – SWIC
- Jean Klein – SWIC
- Jim Lowry – NCUCA
- Larry Cummings – Gastonia
- Rudy Shaw - Aqua America
- Sid Harrell - Public Water Supply
- Terry Rolan - Utility Consultant
- Vance Holloman - NC State Treasurers Office

In addition to these members, Linwood Peele suggested that we make contact with NC Rural Water Association – Daniel Wilson, Executive Director - and gain insight from Lowell Gunter, Training and Technical Assistance Specialist who has drafted a Small System Asset Management training seminar as administered by the NC Rural Water Association.

The group had general opening remarks relative to the importance of Asset Management and some of the limitations relative to funding of maintenance items in North Carolina. Steve delivered an Asset Management Best Practices guide as

prepared by USEPA that identifies the five core questions of Asset Management including :

1. Current state of assets;
2. Level of service;
3. Critical assets;
4. Minimum life cycle costs;
5. Long-term planning.

It was suggested that this straight forward and simple EPA summary should be presented to the SWIC at the Friday, May 15th meeting.

The group also framed out the specific focus of the Task Force to the following areas:

1. Provide a general description of Asset Management;
2. Describe existing Asset Management practices in North Carolina for small, medium and large systems;
3. Discuss current funding practices, both opportunities and limitations;
4. Present any recommendations or policy considerations that the State Water Infrastructure Commission may consider relative to a stronger adoption of Asset Management in North Carolina and incentives for proactive Asset Management.

These notes will be sent to all the members who expressed their interest to be on the Asset Management Task Force and an additional conference call will be set.

Steve committed to communicate with NC Rural Water and to consider a few speakers who could present information to SWIC over the next few months.

The conference call was adjourned at 3:40 p.m.

# *Appendix 5*

Department of Environment and Natural Resources
May 8, 2009

GUIDANCE FOR WATER SYSTEMS ON MEETING THE LEAK DETECTION AND REPAIR REQUIREMENT FOR STATE LOANS AND GRANTS

Effective July 1, 2009, a water system seeking state funds for water line extension or expansion of water treatment capacity must have a leak detection and repair program. G.S. 143-355.3(b)(2). The funding agencies agree that the intent of the legislation was to require a basic program for identifying and reporting leaks and acting on that information. The level of effort necessary to meet the eligibility criteria will be below the level of effort required to receive priority points for a water loss reduction program under the existing common criteria used by the funding agencies.

The water system must include in its funding application a description of a program to identify, locate and respond to leaks in water lines and other water system infrastructure. The program is not required to use any particular technology or method of leak identification, but must be designed to actively gather and act on information about leaks in the water system. A description of the leak detection and repair program should include the answers to the following questions:

1. What tools, programs or activities are used to proactively identify and locate leaks?
2. Do written standard operating procedures exist to describe these activities?
3. How is the information on leaks tracked and managed?
4. How is information from the leak detection program acted on? Describe how the information in used in making decisions to replace, repair, or delay action on pipes and appurtenances with known leaks.
5. How is information gathered in the leak detection program reflected in the capital improvement program?
6. How effective has the leak detection program been in reducing water loss?
7. What future activities are planned?

Answer with sufficient detail to provide a clear picture of the leak detection and repair program. For example, in describing activities undertaken to identify and locate leaks, include information on the frequency of those activities.